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ABSTRACT

This study explores the possibilities of graphotherapy, which uses handwriting analysis and instruction to change or improve such character traits as self-concept. Three fourth-grade classes were involved, one as the experimental group and the other two as controls. A pretest ascertained self-concept, as well as physical handwriting changes that might occur. The experimental group was taught certain handwriting strokes that are taken to be indicative of self-concept, while the control groups received only the formal penmanship lessons prescribed by the regular school curriculum. After a posttest at the end of six weeks' instruction, the experimental group showed significant gains beyond the 0.05 level in self-concept and substantial improvement in handwriting stroke, while the control groups displayed only minimal handwriting gain and a decided loss in self-concept. The study concludes that a definite correlation exists between handwriting change and improved self-concept and that graphotherapy was the change agent for the experimental group's improved self-concept and handwriting achievement. (Author/RL)

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ABSTRACT

CAN SELF-CONCEPT BE IMPROVED IN A GROUP OF CHILDREN BY CHANGING CERTAIN HANDWRITING STROKES IN THEIR WRITING?

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PREFACE

For the past five years, I have been employing handwriting analysis in my educational work, teaching and lecturing. I had hoped through this research study to prove by statistical measurements the validity of handwriting analysis and to open a new avenue for its use, thus enabling man to better understand himself and to aid and benefit those who need help. My greatest disappointment has been that this emerging science, with its potential and infinite possibilities, has been largely ignored by the general public.

It is with sincere appreciation that I thank my research advisor, Joseph Bartaluzzi, Ph. D., Principal of Parkview School, Milwaukee, Wisconsin, for his friendship, helpful suggestions, and guidance in preparation of this dissertation.

I am indebted to Miss Charlotte Grobner, teacher of the experimental group, for her patience, talent, and cooperation in conducting the experiment. I am also indebted to the students as well as the parents for their interest, concern and cooperation.

I am grateful to Gary Peterson, Ph. D., Research Coordinator for the Milwaukee, Public Schools, for his time and effort in helping compile the statistical data necessary for the research in this study.

I am especially appreciative to Miss Lillian

Paukner, former Executive Director of Curriculum and Instruction for the Milwaukee Public School system, who gave of her time in editing this paper.

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CHAPTER I

INTRODUCTION

Probably the most serious problems a teacher faces today are those of control and discipline. In recent years, with the advent of children's rights, the reduction of the teacher's role as surrogate parent, and the general restlessness of the adolescent population, this problem has been compounded to a degree unlike anything experienced by educators in the past.

There are many factors which contribute to a child's acting out against the established order. It was the purpose of this paper to concentrate on one of the character traits that might be responsible for a student's negative social behavior: a poor self-concept.

If it is possible to improve the student's self-concept, to help him see himself more favorably and acquire a feeling of worth through accomplishment and purpose, then it might also be possible that his attitude toward school would change to one of positive action and contribution.

If a student cannot see himself in a favorable light, if he meets nothing but failure and little or no success, there is likely to be a reaction of some kind.

a feeling of worth through accomplishment and purpose; then it might also be possible that his attitude toward school would change to one of positive action and contribution.

If the child's classroom attitude can be improved, then other benefits such as the child's scholastic achievement can also be enhanced. If the teacher is relieved of the necessity of devoting too much of his time to disciplining or controlling pupils, this time can instead be devoted to teaching academic skills, and thereby, help improve the child's scholastic level. When one considers the fact that in inner city schools, where most of the time should be devoted to teaching the academic skills, a vast majority of the time is actually wasted in attempts to gain order or control, it is apparent that any change that will enable the teacher and student to devote increased time to academic pursuits will be profoundly beneficial.

Statement of the Study

This study was an attempt to determine if any significant change in character traits in a specific group of children could be brought about by a change in that group's handwriting. Handwriting analysts have for years theorized that handwriting reflects personality and that as the personality changes, so does the handwriting.

Milton commented on this by stating that when change takes place in the intellectual or moral nature of

son, his handwriting reflects those changes. (Milton, 1970, p. 17)

Further evidence is shown by Muhl's findings that handwriting before, during, and after psychotherapy shows many changes. (Muhl, 1950, p. 315)

Another reference to this same subject is made by Roman:

> It is known that self-conscious or tensions affecting a subject is a test situation, changes the expression and mode of writing... Furthermore, personality is continually in process of change. Personality grows, matures, develcpes and ages. These are subject to experiences that are immediately reflected in the handwriting. (Roman, 1952, p. 113)

If this is true, then the reverse may be true. If handwriting is changed, so also might the individual personality be as the author will attempt to investigate. This theory was preceded by a review of the literature,[1] and additional confirmation was supplemented by this particular research.

There are many traits which comprise the complex inner man and each of these traits plays a self-evident part in that entire composition. This study concentrated on only one of those traits, self-concept.

The hypothesis was tested by analysis of a pre- and post-test of self-concept to measure any difference that occurred as a result of the experiment.

[1]M. N. Bunker, Graduate Course #3, refers to this theory; Paul de Sainte Columbe is at present active applying this theory with adults and children in San Francisco detention farms and mental hospitals. Further details will be found in Chapter III.

Significance and Organization of the Study

The importance of this study can best be described in the following way: In an urban school society in which strife is often the rule, disrespect and disdain of authority the accepted norm, improvement in the attitude of the pupils toward school would enhance order and success. The significance of the research, therefore, was to investigate the possibility that improved self-concept can occur through programmed changes in handwriting.

For the purpose of this study, two hetrogeneous groups comprising the three fourth grade classes of the same hetrogeneous school were selected. The control group, made up of two seperate classrooms was taught penmanship using the Scott, Foresman Compendium which was the official penmanship book used by the Milwaukee Public School system. The lessons taught the control group were exactly the same, consisting of following the perscribed writing format of the compendium which emphasized legibility, slant, and formation of letters as described by the book's author.

The experimental group received specific handwriting exercises aimed at developing certain positive character traits in the students.

The teacher who instructed the experimental group was given directions in the technique to be used in changing a few basic writing strokes to bring about changes in

self-concept.

No attempt was made to change any of the other traits that make up an individual's personality; for that would require a different type of study. The purpose of this study in changing handwriting strokes, then, was limited to whether or not changes in self-concept alone could take place. If they could, the significance becomes apparent. A program of graphotherapy could become a dramatic new tool, not only in the field of education, but also in the areas of psychological counseling, marriage and child problems, rehabilitation of criminals, or any area in which people wanted to bring about personality change.

Definition of the Terms

For the purpose of this study the following definitions of terms were used:

"Handwriting analysts" refers to people who study handwriting in an attempt to gain insight into the writer's personality or character traits.

"Graphoanalysis" refers to a valid and reliable technique of analyzing handwriting.

"Graphotherapy" implies changes or improvements in character traits brought about by changes in handwriting.

"Strokes" are the movement of the writing instrument that go to create the various letters of the alphabet.

"Self-concept" is the appraisal of one's worth or image by the individual.

"Self-reliance" indicates the ability to rely on one's own opinions and decisions to the exclusion of depending on others.

Limitations of the Study

The limitations of this study are several: numbers involved, geographic area, factors of investigation, normal variables and teacher skill. The numbers were limited to the fourth grade students for several reasons. These students were accustomed to formal penmanship classes. They would be in school the longest of the intermediate pupils, therefore, accessible for retesting in later years to verify any possible self-concept improvement. This grade division was also the largest of the intermediate classes. The selection of which group was to be the experimental one and which were to be the controlled groups was decided by numbers drawn from a hat. The first room number of the three chosen was to be the experimental group.

The geographic boundaries of the school limited this to an urban middle class population of similar socio-economic characteristics in Wisconsin.

The limitations regarding factors of investigation are the many varied character traits comprising the entire trait structure of a personality that the experiment could

measure. It was decided to employ only those traits representing self-concept.

The variables were several. The first and probably the most important was that the experimental group was taught by one teacher and the two groups composing the control group was taught by two other teachers. Despite the similarity of sex, age, education and teaching experience, the individual variables, no doubt, played a great part in the performance of the individual classes. Items such as teachers expectations, standards, personality, teaching techniques, dedication, and individual differences all played a part in influencing the outcome of the experiment.

A second variable was the approach to the penmanship lessons itself. The experimental group concentrated on the primary stroke formation of the prescribed "t" and "d" formation as well as underscoring to try and instill self-reliance. The control group was instructed in the correct formation, as indicated by the Scott Foresman Compendium, of the correct way to write the entire alphabet. These lessons emphasized form, arm movement, slant and stressed legibility as the prime directive.

A third variable was the Hawthorne effect hypothesis which will be discussed later.

Despite the obvious influence of the variables mentioned it was felt the experiment still might have some value to investigate whether any recorded change in

self-concept might be brought about at the end of the experiment.

The unusual nature of this research demanded that the work of this study be under the direction of a highly qualified individual in the field of handwriting analysis. With this fact in mind and with the intention to qualify himself, the following was felt to be in order: The examiner has been a master graphoanalyst for five years and has lectured on the subject and taught graphoanalysis to adults for the Milwaukee Public School Adult Recreation Department for the past three years. He holds a Master of Graphoanalysis diploma from the International Graphoanalysis Society in Chicago and has attended summer sessions in Chicago to increase expertise in this field.

The initial planning consisted of administering a standardized test of self-concept. "The Self-Appraisal Inventory" distributed by Instructional Objectives Exchange of Los Angeles, California was chosen because it covered the four main self-concept areas in the child's world: peer groups (as the child feels his peers see him), school rating (as the child feels the school sees him), family rating (as the child feels the family sees him), and self-concept (as he sees himself). Its format best represented the areas of interest of this particular research. Approval to reproduce and administer the test was a courtesy extended by the publisher. (See Appendix A)

After an interval of 30 days, a post-test was administered. During the interval, the experimental group received lessons in specific handwriting stroke changes designed to improve self-concept. The control group received no formal handwriting lessons other than that prescribed in the regular school curriculum. At the conclusion of the post-test period, the results were computed to check for relationships between improved self-concept and any possible handwriting change that might occur. A test was devised to measure pre-test and post-test physical handwriting changes. (See Appendix B)

The pre-test list of words contained the desired stroke changes necessary for self-concept improvement was given to both the experimental and control group. After the interval, the same list of words was given to the two groups once again, with a variation for the experimental group to avoid giving this group an advantage, as explained later.

CHAPTER II

REVIEW OF LITERATURE

History of Handwriting Analysis

The literature was reviewed with the express purpose of attempting to identify research that had been done on validating or reputing the authenticity of handwriting analysis in revealing character traits. In surveying the literature, only a limited number of books and a slightly higher proportion of journals and periodicals were found to contain specific information related to the topic. The overwhelming majority of the available literature was positive in its approach to the subject matter. Few negative articles were found, perhaps because science has not considered this subject important enough to warrant more thorough investigation. Another possibility is that the authors of this literature would probably have a tendency to write favorably on their field of interest.

Background information on the history of handwriting analysis was given special attention because the field of handwriting analysis has been exploited by pseudo-experts and frauds in the past.

Handwriting analysis might be defined as gain-

ing insight into an individual's character traits as revealed by that person's handwriting. In essence, however, this is a misnomer, for in reality, no one's hand ever does any writing. It is the mind, the brain, that conceives the thoughts, the ideas, and inspires the writing. The hand is merely the most convenient vehicle that the brain has found to put its ideas on some form of parchment, paper, or other substance.

The term "brain writing" was first conceived by L. Voss, a pioneer German handwriting analyst, in the latter part of the 19th century. (Preyer, 1928, p. 56)

The influence the brain has on the construction of the formation of letters was given added support in more recent publications. Pophal believed that the problem of form prevalent in graphology can be clarified through the Aristotelian concepts of form, substance, and motion. According to him, the substance of the mind manifents itself in the stroke which is the fundamental basis of handwriting. (Pophal, 1950, p. 60)

Kluge approached this subject in a slightly different way by using hypnosis to illustrate that as the mind sees itself, so it writes. By means of hypnosis, change can be effected in writing and hand pressure curves. Under hypnosis, different occupations and settings were suggested to the individual's involved (dancer, king, beggar, child). The dynamics of the various situations were reflected in the changed pressure curves of the subjects

writing styles. (Kluge, 1951, pp. 230-234)

Another indication of the effect of the brain on handwriting is shown by the influence alcohol has on nullifying clear thinking of the individual and the subsequent effect on his writing.

An article related that the experimenter obtained handwriting samples from a group of 40 males before and after giving them alcohol. Among the significant effects of alcohol was that it caused the subjects to take more time in writing and it increased the size, width, and all spacing of the letters. The clarity of the writing also diminished under alcohol. (Rubin, 1953, pp. 284-287)

Allport summarized his research as follows:

> There is a strong case to be made for handwriting analysis. It is, as proponents argue, not merely handwriting, but also "brain writing", influenced by all manner of expressive neutral impulses giving individual flavor to the coping movements of the hand. As "crystallized gesture" it is by all odds the most accessible of expressive movements for study; all other movements are fugitive and more difficult to measure. Critics who flatly say, "there is nothing in handwriting" are simply wrong. Many studies, in fact, show that handwriting analysts are able to diagnose some personality characteristics above chance. (Allport, 1961, pp. 488-489)

"In writing or artistic expression," Werner concurred,

> man not only communicates his conscious thoughts, but also his underlying thought, a biopsychological pattern of which he is unconscious and by which graphic movements become a "diagram of the unconscious". There is further inference that graphic movements reveal certain consistencies which cannot be explained by chance, nor by learning, nor by imitation of a set pattern. These manifestations of the unconscious are, according to

> Freud, the same in all media of expression. (Wolff, 1948, p. 423)

The sum of these findings tend to show that there is a relationship between the hand's ability to function and the condition of the brain. Whether it be influenced by alcohol, auto-suggestion, or normal conditions, the brain obviously is in command of the hand and its writing functions. This close relationship stresses the interaction and control of the brain over the writings.

No one knows who first discovered the possibility that character traits could be identified in handwriting or how this information ultimately found its way to the present time. It would appear that the simplest explanation was that this information was passed on from person to person in much the same way that ancient medicine men passed on their knowledge of herbs and other primitive medicines to their successors. One of the earliest men of prominence who displayed an interest in handwriting was Aristotle. He observed:

> Spoken words are the symbols of mental experience, and written words are the symbols of spoken words. Just as all men have not the same speech sounds, all men have not the same writing. (Roman, 1952, p. 3)

One of the first mentions of handwriting analysis in the legal professions took place in the Roman courts of Nero. "Nineteen hundred years ago, in ancient Rome, one day the Emperor Nero found himself wary of a certain man at court. 'His writing shows him to be treacherous,' said the Emperor." (Bunker, 1967, pp. 3-4)

It was in 1622 that an Italian scholar, Camillo Baldo, wrote the first book on the subject of handwriting analysis, Treating of How a Written Message May Reveal the Nature of Qualities or Talents of the Writer. (Bunker, 1967, p. 13)

In 1872, the Abbe Michon of Paris coined the term "graphology" and published his book on the subject, Les mysteres de l'ectriture. It was he who popularized handwriting analysis by translating former works in the field into the everyday language of the common people. As a result this fledgling science of handwriting analysis spread rapidly throughout Europe. Today it is used extensively in European commercial, industrial, and banking establishments to evaluate personnel applying for positions of employment. (Bunker, 1967, p. 13)

Among men of behavioral science who have had more than a passing interest in handwriting analysis as a science was Crepieux-Jamin, who in 1890 interested Alfred Binet in it as a test of intelligence as well as a test of personality. In 1904 at the Sorbonne, Binet tested handwriting analysis to determine if handwriting could identify age, sex, intelligence, and honesty of the writer. Findings for sex and age were largely negative; for the latter two characteristics, findings were positive. Binet then concluded that it was impossible to identify sex or age from handwriting samples. (Binet, 1904, pp. 179-210)

These findings on sex and age have been accepted by handwriting experts for sex and age are physical features. Handwriting analysis reveals only character traits.

Sigmund Freud expressed in a letter to T. Riek the frustrations that early handwriting analysts felt.

> After I had read this passage, he (Sigmund Freud) turned my attention to the patient's handwriting. "What do you think of it?," he asked... "There is no doubt," said Freud, "that men also express their character through writing. What a pity it is that its understanding is so ambiguous and its interpretations so uncertain!" (Rick, 1956, p. 22)

Freud's words, regarding the accuracy of handwriting interpretation, describe the main obstacle handwriting analysts faced in achieving universal acceptance and recognition. No one had taken time to check the validity and/or reliability of the theories of prior handwriting hypotheses.

Such was the situation until Milton Bunker began his research. Bunker spent 14 years (1915-1929) in research and testing validity and reliability of handwriting analysis. Bunker approached the subject of handwriting analysis from an entirely different point of view. Unlike previous graphologists who attempted to fit a preconceived idea of what strokes fitted a certain personality, he did not try to justify anything, but rather he searched merely to find answers to questions in this field.

Fortunately, Bunker had a steady reservoir of correspondence running into the thousands. Being a penmanship teacher, he was a regular contributor to educa-

tional journals and other magazines on the value of good handwriting. This correspondence became his testing grounds for checking the validity of handwriting analysis, and after 14 years he had established a reliability of accuracy that was unmatched by any previous person in the field.

Bunker established the International Graphoanalysis Society whose membership new exceeds 100,000. Many professional people belong to this group including one governor, all types of doctors, many lawyers, church leaders, businessmen, bankers and others. Its' present president, V. Peter Ferrara, through the enforcement of stringent regulations which each member must adhere to, has probably done more to gain professional acceptance for handwriting analysis than any other individual. (Milton, 1970, p. 12)

Accuracy of Handwriting Analysis

It is difficult to measure the accuracy of any behavioral test, but the results of tests relative to the accuracy of handwriting analysis have revealed some highly favorable correlations.

Arnheim conducted a unique and interesting study correlating handwriting analysis and paintings of the old masters. He reported that the experimenter asked handwriting analysts who had never seen the handwritings of Michelangelo, da Vinci, and Raphael, to match their handwriting specimens to verbal sketches of their personali-

ties. Arnheim found an accuracy in 83.6 percent of cases instead of the 33.3 that might be expected by chance. (Arnheim, 1928, pp. 1-123)

Further indications of accuracy are offered by Galbraith. Three graphoanalysts judged specimens of handwriting for five personality traits: attention to detail, domineering, persistence, self-consciousness, and stubbornness. The average inter-judge correlations was .78. Reliability was, therefore, established. Advantages of handwriting analysis that enhance its potential validity are pointed out, as well as its usefulness in identifying fake and artifactual change. (Galbraith, 1964, pp. 615-618)

Further reliability indications were found in a study by Muller in which 10 handwriting analysts were asked to rate 12 handwriting samples for the presence of 20 signs from a suggested list of 150. Interrated agreement was 70 percent, considerably beyond chance expectations. (Muller, 1961, pp. 364-389)

In 1943 Pascal conducted an elaborate study of normal personality done at Harvard University, involving 36 personality variables by J. A. Murray and 39 discrete handwriting signs. At the one percent level of confidence, nine significant first order correlation coefficients were found. (Pascal, 1943, pp. 123-144)

An experiment by Pascal led to another conclusion:

> This experiment, designed to test the significance of handwriting variables for personality, is completed. Hundreds of quantitatives estimates of relationship were calculated. Of these, 16 were found to be significant, nine first-order correlation coefficients, and seven multiple correlation coefficients... For our population, certain aspects of handwriting are significantly related to certain aspects of personality. (Pascal, 1943, p. 144)

Some doubts regarding the reliability of handwriting analysis were raised by Allport. In a two part study thesis to check the reliability of this subject, the second part dealt with recent experimental work in graphology and presented two experiments which were designed to test the skill of a graphologists and layman. The author concluded that he had no opinion regarding the value of commercial graphology. He felt that probably too much had been claimed for it by the graphologists and too little by psychologists. (Allport, Vernon, 1933, pp. 1-269)

Another author maintained that graphology with it's empirical methods is still in the dark ages. In order to progress it needs philosophical reflection and experimentation. Graphology, he felt, was following in the footsteps of medicine, which has long been studying posture and gesture and drawing conclusions from them. More concrete proof other than this method is needed. (Ghislain-Houzel, 1932, pp. 5-7)

Comparison With Psychological Research

How much validity does handwriting have when compared with some of the existing psychological tests?

> There seems to be as much justification for believing that handwriting is a valid expression of personality as finger-painting, copying a Bender-Gestalt design or drawing a person, although more of the personality is likely to be projected into some of these techniques than others. Frederick, 1965, p. 218)

Hartoch compared handwriting analysis with Rorschach responses. Among the relationships found was that the subjects with a large number of responses to ink blot cards interpreting the pictures as showing rapid human action or movement showed signs of inhibition in their handwriting, whereas subjects with few such responses displayed signs of strong, emphatic motor activities. This pattern is consistent with Rorschach's early claim that subjects who are high in movement responses also tend to be inhibited insofar as overt motor action is concerned, and vice versa. Other findings, too, were considered to be consistent with Rorschach's speculations regarding the mode of apperception. (Hartoch, 1963, pp. 351-357)

Raeven found that on the basis of experiences with 300 epileptics there seems to be some degree of congruence among handwriting, Rorschach responses, and EEG tracings. (Raeven, 1966, pp. 163-165)

A comparison of handwriting analysis with established projective techniques was done by Victor when he

stated that if the dynamic expression of handwriting analysis is concerned and the individual is as familiar with psychology as one who is using Rorschach, TAT or other projective methods, the application of the handwriting analysis as a projective technique is possible. He further concluded that some handwriting analysts would themselves, particularly in the United States, put special emphasis on the expressive rather than the projective side of this method of personality interpretations. (Victor, 1960, pp. 351-357)

An American writer, Modlin, compared the relationship between handwriting analysis and psychology:

> The study of handwriting, is an acceptable component of modern psychology. Any overt behavior of man, is a proper subject for scientific screening, and is one component of behavior which reveals some characteristics of each individual personality. The handwriting of each person is probably as unique as his face or his fingerprints. Handwriting analysis has not attained the popularity or prestige in the United States that it has in Europe, but a number of respected psychological scientists are pursuing it with interest. (Modlin, 1969, p. 240)

An experimental research study dealing with psychological factors involved in handwriting analysis was described in a report from Europe. The results show that each subject has a characteristic time, speed, and rhythm in writing each letter; the pressure is also characteristic, as well as size. Practice, habits, and culture influence writing, but they do not modify the personal characteristics of writing nor its rhythm. Writing is a characteristic gesture and like other expressive gestures, it is

an indication of the behavior of the subjects in their psychomotor activities. (Gemelli, 1950, pp. 1-53)

A final interesting comparison between handwriting validity and the applied science of psychology was reported by Wells. In the years between 1939 and 1941, the Department of Hygiene of Harvard University conducted a large experimental investigation on the expressiveness of handwriting as part of a research focused on the normal personality. Data was collected on 108 cases and comparisons were made between diagnosis by handwriting analysis and the diagnosis evaluation of a psychiatrist.

The following conclusions were reached in this segment of the study:

> ...handwriting and history agreed about twice as often as they disagreed; agreement occurred, that is, in about 70 percent of the judgments made. A special finding appeared in respect to traits; the best agreeing would agree in something over 80 percent of the judgments; the least agreeing trait would show not over 50 percent or chance agreement. More specifically, a neurotic script is unlikely to be associated with a sound personality. In the case of the various traits, the agreement is as follows: the diagnosis of emotionality and calmness in 89 percent; and extraversion in 73 percent. Egocentrism appears to have been estimated by the handwriting analysis in some two-thirds of the cases where it was found by the psychatrists. (Wells, 1946, p. 309)

A study by Kimmel and Werthermir at the University of Chicago regarding reliability between handwriting analysts and psychologists had a different result. They selected a handwriting analyst to blindly rate standard handwriting samples of 22 subjects on five personality dimensions chosen and defined by the authors in consultation with two

counseling psychologists. The psychologists rated the subjects independently on the same scale. There was evidence of inter-counselor agreement, but no clear evidence of agreement between the analysts rating and those of the counselors. (Kimmel, Werthermie, 1961, pp. 177-178)

At an International Graphoanalysis Society congress meeting in Chicago, Crumbaugh made this statement, "Handwriting analysis will be an integral part of routine clinical procedures for the psychologist before long." Crumbaugh, clinical psychologist of the Veteran's Administration Hospital of Golfport, Mississippi, further stated that several studies indicate that handwriting analysis is as well validated as "many other projective techniques of personality assessment currently in use, and in fact has definite advantages over most other clinical tests." (Crumbaugh, 1970, p. 4)

It would appear, then that there is a great percentage of accuracy above and beyond what could be expected by chance in dealing with correlations between a person's handwriting and his personality traits. Indications also tend to support the assumption that handwriting analysis can, and probably will, play an expanding role in the future of psychoanalysis, identifying character traits previously had been researched primarily by existing psychological testing devices.

How can it be used, and in what areas should it expand? How effective can it be and who will use it?

These and other questions have been only touched so far by research.

Handwriting Analysis as an Aid to Psychotherapy

Psychotherapy is one field that some authors feel lends itself well to the use of handwriting analysis.

Marchesan reported on the relationship between handwriting psychology and psychoanalysis, psychiatry, and experimental psychology in their theoretical and practical aspects. He found that handwriting psychology has accepted several psychoanalytic principles, revising them to obtain a system which has already proved its therapeutic validity and usefulness. (Marchesan, 1965, pp. 262-268, 383-395)

Muhl feels that handwriting should be used in preventive psychotherapy. He used 885 pages of handwriting of 75 cases of schizophrenia before, during and after electroscock treatments to show that certain aspects of the writing remain constant; namely, strong secretiveness, defensiveness,and unconscious regression. The chief value of the findings is seen in the field of preventive psychotherapy. Detection of secretiveness, defensiveness, and unconscious regression early in childhood by means of handwriting provides opportunity for overcoming of these tendencies. (Muhl, 1950, pp. 212-215)

Using handwriting analysis as an aid in dealing with mental disorders and brain damage was suggested by Suchenwirth. He reported research which compared signatures, scribbling, handwriting, and drawing samples of normal adults and children with those of 1234 subjects classified as schizophrenic, cyclothemic, brain damaged, mentally retarded, or conduct disordered. Longitudinal data were obtained from 200 of the subjects. In total, 8700 graphic samples were investigated, part of which were obtained while subjects were under the influence of diazepam, barbituates, morphine, amitriptyline, chlorprothixene, or psilocybin. Deviations from writing and drawing norms were classified as: disharmony in graphic representation, loss of movement, enlargment, loss of Gestalt. These deviations are discussed in relation to the disorders for which they were found to be characteristic in the individual, suffering either from the ailment or drug addiction. (Suchenwirth, 1967, p. 113)

This theme was also carried out by Perron. Handwriting samples were obtained from 100 subjects, 63 being diagnosed as epileptic with seizures, and 37 being diagnosed as mentally ill in various other ways. Handwriting was scored on 12 variables predicted to discriminate between the two groups. Differences between group mean scores were reported as significant. Blind diagnosis was correctly made in 76 percent of the epileptic group. (Perron, 1957, pp. 1-10)

Analysis of handwriting as a preventive device in identifying or deterring potential criminals and in acquiring insight into the various aspects of behavioral patterns can become a useful tool in the field of social development.

Two other miscellaneous fields where handwriting analysis could be used are suggested by Muhl and Cohen. Muhl, from study of the character and handwriting of 100 truants and 500 delinquent girls, arrived at the conclusion that people with trends toward unreliability and unpredictability in behavior (whether intentional or unintentional) manifest these in their handwriting early enough so that preventive treatments can be given before the behavior becomes overt and the writer has any serious adjustment problems. Of 23 factors found in the handwriting of 90 out of 100 cases selected at random, four or more negative traits are repeatedly found in persons of unreliable behavior. The four dominant negative traits most found are fear, anxiety, emotional instability and moodiness. (Muhl, 1950, pp. 312-315)

Cohen turned his attention to the use of handwriting analysis in the schools. In this article, general principles of handwriting analysis are explained. It explains how the teacher can, by means of this handwriting technique, discover current psychic difficulties of the child and the basic traits of character. (Cohen, 1950, pp. 191-218)

Strokes Reflecting Trait Changes

Several researchers have investigated the effect of form and various writing strokes to reflect character traits and behavior that can be recognized in the individual's writing. Emotional behavior was one trait that seemed to be of concern to several writers.

Linton tested 53 male college freshmen for the relationship between a secondary beginning stroke in their handwriting and several behavioral variables. Those subjects with many beginning strokes showed less intellectual ability, a less active approach in dealing with new tasks, more readiness to accept cliches, avoidance of emotional stimulation, and greater anxiety. (Linton, 1961, pp. 271-281)

O'Brien of Marquette University discussed handwriting in a series of articles, each by an authority in his field. The main theme was the rationale underlying the measurement of expression of emotions as revealed in cursive writing which involves the slant of the stroke as well as the pressure of the writing. (O'Brien, 1960, pp. 281-409)

The identification of compulsive and neurotic children through writing was recognized by Brick. In this study it was observed that among children between three and 15 years of age, compulsive and neurotic children excelled in diminutive drawings; the rejected and deprived children used only a small part of the paper,

usually the bottom of the page. (Brick, 1944, pp. 136-146)

It would appear then that there is evidence of a certain relationship between the various character traits of the individual and the strokes made in his writing. Most people's handwriting is in a constant state of change. The change that takes place in the writing possibly reflects the addition or substraction from that individual of some character trait or traits. As one acquires new traits, new strokes may appear in that writing, as one loses old traits, writing strokes that reflect those traits might disappear from the writing.

Several authors investigated that particular area of research and pointed out the changes that took place as the individual's character traits changed. Changes in handwriting may be of long term endurance, as when one acquires new traits, or of a temporary nature due to fatigue, pressures of the day or work, temperment and mood.

Muhl made the observation that when handwriting analysis is done by a trained person with good scientific background, it is a very useful diagnostic aid in general medicine, particularily in psychiatry. In the evaluation of the handwriting of all the members of the family, one frequently can identify clashes of personality. Handwriting before, during, and after psychotherapy shows many changes. The chief aspect of handwriting evaluation should be preventive. (Muhl, 1950, pp. 312-315)

Downing did further research in this area. He found that temporal changes occurred in handwriting size, depending on the level of premorbid social functioning and the intellectual level of persons suffering acute schizophrenia. Using handwriting size decrement as an indication of increasing control, it was hypothesized and found that patients showed a greater degree of diminishment in handwriting size and quality after the end of the treatment. Change in handwriting size could not be related to change in Lorr factor (scales used to rate damage to the nervous system with the purpose of assigning subjects to the proper diagnostic classifications) scores, thus providing some evidence that the size of changes observed could not be accounted for merely in terms of general mobility and mood. (Downing, 1966, pp. 516-533)

An accurate summary of handwriting changes which occur during and after therapy was offered by Schwung. The author was concerned with how changes brought about in therapy are revealed in handwriting. For this purpose, she compared the handwriting before and after treatment in 14 cases and the handwriting of some individuals who changed without treatment. She found that almost everything in handwriting except rhythm and form can change. Her research showed that only the energy structure is subjected to decisive changes. The total quality of energy remains static, but its various components, such as shape, size formation of individual strokes and slant, can be

changed and thus bring about a different character to the handwriting. (Schwung, 1953, pp. 284-294)

It is quite possible that certain physical changes do occur in handwriting as the individual himself undergoes change, whether it be medical, emotional, or normal growth. These changes may be used, as pointed out by the preceding writing, in possibly locating and diagnosing certain problem areas in the human psyche. Can handwriting analysis, however, go a step further in this area and act not only as a tool to locate and diagnose, but to actually bring about desired changes in the individual, to alter negative traits or replace them with positive ones?

Legain expounded on the evolution of spontaneous writing in an infant which throws light on the child's mental make-up and commented that when the style of writing is crystallized, it is impossible for a writer to change it; this act of changing writing belongs to the domain of the subconscious. (Legain, 1930, pp. 194-202)

This is what the author sought to find out. Could the conscious mind, over a period of six weeks of training, change and introduce new character traits to the subconscious through handwriting exercises so that these new traits would become part of the individual?

CHAPTER III

RESEARCH TECHNIQUES

Hypothesis

Findings at this point in this research would seem to indicate there is apparent relationship between character traits and handwriting, and that as a person's character changes, his handwriting possibly changes proportionately. If this is the case, then it may or may not follow that if one changes his handwriting strokes, those strokes may also change.

This technique of changing one's character traits by changing handwriting, known as graphotherapy, has been done on an individual basis by at least two handwriting analysts. Bunker induced changes in many individuals by having them practice certain strokes that reflected the changes he sought to bring about. It is also possible, of course, that he may have brought about change by the mere psychological affect of the attention and help he offered his subjects. No statistical research had been done to prove either case.

Part of this study was to obtain some sort of ststistical information regarding the effectiveness of his

techniques and methods suggested to bring about character change through handwriting. The time he suggested for practice in these experiments was one-half hour per day, for thirty consecutive days. (Bunker, 1967, p. 6)

At present, a handwriting analyst in San Francisco, Paul de Sainte Colombe, is engaged in individual graphotherapy with adults and adolescents at the Santa Clara County juvenile detention farm in California, as well as with other West Coast behavioral scientists, the California Patton State Hospital and the Santa Clara Mental Health Center. (Time Magazine, Sept. 21, 1970, p. 51)

Unfortunately, no one to date had validated the authenticity of graphotherapy to see if it actually can do what it is purported to do. The intent of this paper, therefore was twofold: to attempt to validate this theory of character change induced by handwriting change, and to carry this theory one step further and see if graphotherapy could be applied to a group of people, rather than only to an individual.

The hypothesis of this research was an attempt to investigate whether changing certain handwriting strokes in a group of students, one can obtain a change in the entire group's self-concept.

Design for Classroom Procedures

The subjects who composed the group in this study were children enrolled in the Hi-Mount Boulevard School,

Milwaukee, Wisconsin, during the school year of 1972-73. This school was chosen for several reasons. Primarily, the examiner was principal of this school and had the cooperation of teachers and parents involved in attempting this experiment. Also, the children had been exposed to many previous experimental studies dealing with new and innovative teaching methods over a period of years. It was hoped that this prior experience would help negate or at least minimize the Hawthorne effect. In addition, this school was considered to be a prime example of the so-called "average" middle class Milwaukee school, being in the center strata of the socio-economic and intellectual grouping of the school system. The children were students in the three regular fourth grade classes. The reasons the fourth grade was selected were several. It contained the largest number of children in a single grade level in the entire school, the children were conditioned to formal classroom penmanship lessons from the previous grade and would be in the school the longest of any of the intermediate pupils and, therefore, available for retesting over the next two years for any lasting effects of the experiment. The total population of the entire group was 95 pupils. Of this number, 30 were in the experimental group and 65 comprised the control group. The groups were originally selected randomly by drawing room numbers out of a hat. The first room number drawn was to be the experimental group.

The time schedule for the handwriting lessons in the experimental group was established. One-half hour of penmanship lessons per day, five days a week for 30 consecutive school days, was decided upon. This was the time schedule suggested by Bunker in his experiments. A practice time of 15 minutes a day was also urged for Saturday and Sunday. The experimental time was to extend from September 18th through October 27th.

The students of the experimental group were given specific instructions showing the strokes necessary to implement the character trait changes desired to bring about improvement in the group's self-concept. No mention was ever made of the reason why certain strokes were being made the way they were. Both teacher and pupils were told merely to make their strokes in the designated manner. Weekly meetings were held to plan with the teacher the following week's experiment, and daily contacts were made to clarify any questions that might have arisen.

The teachers of the control group conducted normal classroom penmanship lessons prescribed in the curriculum. No one, however, including the teacher of the experimental group, knew what the final objectives were. As far as they knew, an attempt was being made to do something other than making the writing more legible, but they did not have any further information. There was a question here about the Hawthorn effect. How much, if any, had the children's experiences with previous experimental pro-

grams have on this one? The possible influence will be discussed later.

Achievement of adequate or attainable goals should act as an incentive for an improved self-concept; therefore, the primary concern would be to seek to acquire such goals. If this could be accomplished, then a new image might influence the setting of and reaching for practical goals.

In handwriting analysis, practical, short range goals are indicated by the placing of the t bar three-fourths of the way up the t stem. Many character traits which also could influence the achievement of such goals, as well as improve self-concept, were considered in an attempt to further enhance success of the desired goals. Determination, persistence, concentration, decisiveness, enthusiasm; self-control and tenacity were among those taken into account. It was ultimately decided that three character traits would have the greatest influence on improving self-concept; pride, dignity, and self-reliance.

Practical, yet challenging, goals were the yardstick by which success was to be measured. The students needed to aim high enough to be able to succeed but not so high as to meet defeat. Also, the students needed to be challenged enough to achieve a feeling of success when goals were finally reached. A degree of pride and dignity would be essential in this endeavor, for pride in accomplishment is one of the prime motivators for success.

Self-reliance was felt necessary to reinforce the self-concept trait and to encourage confidence in one's own ability, the ability to be independent. If success in these areas could be achieved, it was felt that the logical conclusion would be improvement in the pupil's self-concept.

Goals of an individual vary depending on the placement of the "t" bar.

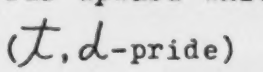
A person who has low goals in life, one whose achievements are not commensurate with his ability, is shown by a "t" bar placed well down on the "t" stem. ()

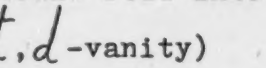
One who aims very high in life, perhaps too high for him to realistically achieve the goals he has set, is shown by a "t" bar which is placed above or very high on the stem. ( )

An individual, however, who sets practical, obtainable goals is shown by a "t" bar placed about three-fourths of the way up on the "t" stem. () This is the ideal place for the bar to be, for it shows the person understands his abilities and his limitations. He thus has a good understanding of his potential and sets reasonable goals in accordance with his abilities.

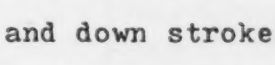
Once the student comfortably and sub-consciously writes his "t" bars in this fashion, his pride and dignity would act as supporting agents to aid and reinforce this newly acquired image.

Pride in their work was introduced into their writing by extending the stem of both the "t" and "d" strokes to a higher point than most had previously done. As previously explained, neither the teacher nor the pupil was told anything about the meaning of any of these strokes. Both teacher and pupils were told merely to extend the stem higher, no reason why was given. As the length of the stem of the "t" and "d" is increased, the pride of the individual is increased proportionately. It must be noted here that care was taken to prevent the stems from extending too far upward which would lead into the realm of vanity.


(t,d-pride)


(t,d-vanity)

Then dignity was added. This stroke had already been demonstrated in the previous sample stroke, for dignity in writing is shown by the retracing of the stems of both the "t" and "d". Retracing is done by the upward movement of the writing instrument as it extends to form the upper case letter and then comes directly down retracing the upper stroke so that no gap exists between the up and down strokes.


(t,d)

Finally self-reliance was included. Self-reliance is shown as a strong, heavy underscore of an indivisual's writing, found mainly under the signature. It is made generally with a sweeping right to left and back to right sweep with the pen under one's name or in the context of writing when one wants to emphasize a point. The students were instructed to practice the underscores on

their signature only. (J. Hancock) The meaning of this stroke formation, like all the others, was not explained or even mentioned to teacher or pupils. They were told simply to write as directed.

The Friday before the experiment was to take place, the examiner explained to the experimental and the control group the procedures that were to take place. (See Appendix C)

To guarantee that each child would remain anonymous, each was given a number for comparison purposes only. The experimental group was numbered one through 30 and the control group, numbered one through 65.

At the outset, each numbered pupil was asked to write a few words emphasizing "t's" and a few emphasizing "d's". This was done as part of the pre-testing procedures so that at the end of the 30 day experimental period, the post-test of their writing would be able to compare any physical changes that might occur in their writing to correlate with the self-concept post-test.

A method had to be devised to acquire an unbiased, if possible, post-test sample of physical handwriting of the experimental group. It was obvious that if the experimental group was told to copy certain words they would respond by consciously reproducing the model or desired writing strokes they had been practicing for the past weeks. In an attempt to diminish this possibility and to secure a copy of this group's normal writing at this point,

the experimental group was given a separate written language essay in their classroom, which included the same words given to the control group. The key words, which were the same used in the pre-test of physical writing, were then deleted from this essay assignment for comparison purposes. This was an attempt to prevent the experimental group from having an unfair advantage in this area. To verify both pre-test and post-test changes in handwriting, five certified graphoanalysts were chosen to evaluate the handwriting for possible change.

So that neither group would have the advantage of the examiner influencing their part of the experiment, the only time the examiner was seen by either group was the day he introduced the project to both groups using the same identical wording. (See Appendix C)

A daily lesson plan for the experimental group was devised and administered solely by the individual teacher. (See Appendix E)

CHAPTER IV

THE ANALYSIS OF THE RESULTS

Overview

The raw data collected for the control and experimental groups were analyzed and compared. It should be pointed out that the norms selected for evaluation purposes were the norms of the test used, "The Self-Appraisal Inventory", distributed by Instructional Objectives Exchange, Los Angeles, California. The purpose of this research was not to discover what the initial self-concept scores revealed, but rather how much improvement, if any, had been achieved between the pre-test and post-test time of the experiment.

This particular study, further, was not intended necessarily to verify long term retention of any self-concept gains that might occur. It would be considered significant if some gains had occurred; the greater the change, the more significant the experiment. If retention of trait changes that might occur was prolonged or became permanent, this would be considered an added factor. Later testing could be used to confirm the length of retention.

If comparison of results showed significant improvement, it would open many fields for further endeavor

and research. Indeed, the whole spectrum of human behavioral reaction would be opened for further investigation. Research in handwriting to further behavioral change for permanent or long term purposes could be limitless. Future investigations might concentrate on one or all personality traits that contribute to the make-up of the personality of an individual.

If, on the other hand, the results did not appear significant between the groups, it could mean the hypothesis was wrong, or that other research should be tried allowing for adjustments, refinements, experimental time extensions, other character traits changes included in the writing, or variations made to further test this hypothesis. This is the basis of research.

Comparison of Physical Handwriting

The most obvious change, because it was the most visible, occurred in the quality of the individual's handwriting. The physical writing improvements desired were in the formation of the letters "t" and "d" only. Whether the over all writing pattern showed improved style, form, legibility, or other outward improvements was of no concern. Improvement was sought only in the formation of the "t's" and "d's" in the prescribed manner in both the experimental and the control group.

A pre-test and a post-test to compare possible

physical handwriting changes between the experimental and the control group were devised, and five certified graphoanalysts compared the writing of the groups before and after the experiment. The students were identified by number, and a numbering system was used to indicate the degree of improvement: (0) signified no improvement in handwriting, (1) signified slight improvement, (2) signified moderate improvement, and (3) signified great improvement. The highest possible score, indicating most improvement, was computed by totaling the combined scores of the five graphoanalysts. The maximum handwriting improvement score would be 15, and the minimum score would be zero. Note should be taken that a person could actually regress in physical handwriting and yet receive no lower score than a zero.

The five graphoanalysts, whose schooling and training qualified them to identify changes in handwriting by using empirical judgment, examined the writing specimens for any change in the handwriting of both the experimental and control groups. They looked for change in the increased height of the t and d stems in comparison with the pretest writing, placement of the t bar three-fourths of the way up the t stem, improvement in the re-tracing of both the t and d stems and any indication of self-reliance by underscoring of names.

Analysis of Physical Handwriting Change

A comparison of the handwriting changes that occurred in the experimental and control groups, based on this rating scale, is shown on Tables 1 and 2 on the following pages. These tables depict the means and ranges of both the experimental and the control group.

TABLE I

RANGE OF HANDWRITING IMPROVEMENT SCORES BY FIVE GRAPHOANALYSTS

	Experimental Group				Mean Total Score= 9.5
Student Number	No Change (0)	Slight Change (1)	Moderate Change (2)	Much Change (3)	Total Score
1			2	3	13
2			3	2	12
3		2	2	1	9
4			3	2	12
5		1	1	3	12
6			1	4	14
7	3	2			2
8	3	2			2
9	1	2	2		6
10		1	3	1	10
11		3	1	1	8
12		2	2	1	9
13		1	3	1	10
14			1	4	14
15	Ill----Out of the entire project----------				
16		2	3		8
17	Moved--Out of the entire project----------				
18			2	3	13
19		3	2		7
20		1	4		9
21		1	2	2	11
22			3	2	12
23		2	2	1	9
24			3	2	12
25		3	2		7
26		1	3	1	10
27		1	1	3	12
28		3	2		7
29		2	2	1	9
30	1	1	3		7

This table shows that a predominant change in handwriting was scored by a great majority of the experimental group. This change reflects the now normal writing formation of the "t's" and "d's" that have been acquired by practice over the 30 day experimental period.

TABLE 2

RANGE OF HANDWRITING IMPROVEMENT SCORES

BY FIVE GRAPHOANALYSTS

	Control Group				Mean Total Score=2.7
Student Number	No Change (0)	Slight Change (1)	Moderate Change (2)	Much Change (3)	Total Score
1		3	2		7
2	2	1	2		5
3	5				0
4	3	1	1		3
5	2	2	1		4
6	3	2			2
7	2	2	1		4
8	4	1			1
9	3	2			2
10	4	1			1
11	1	3	1		5
12		4	1		6
13	2	2	1		4
14	5				0
15	3	1	1		3
16	4	1			1
17	5				0
18	2	1	1	1	6
19	4	1			1
20	4	1			1
21	3	1	1		3
22	2	3			3
23	4	1			1
24	4	1			1
25	3	2			2
26	3	1	1		3
27	4	1			1
28	4	1			1
29	Moved---out of the entire project---------				
30	4	1			1
31	3	2			2
32	2	3			3
33	4		1		2
34	3	2			2
35	1	3	1		5
36	4	1			1
37	3	2			2
38	2	2	1		4
39	3	2			2
40	4	1			1

TABLE 2 - Continued

Mean Total Score= 2.7

Student Number	No Change (0)	Slight Change (1)	Moderate Change (2)	Much Change (3)	Total Score
41	3	2			2
42	3	2			2
43	2	3			3
44	3	2			2
45	5				0
46	1	3		1	6
47	1	2	1	1	7
48	2	3			3
49		3	2		7
50	1	2	2		6
51	2	2	1		4
52	3	2			2
53	2	2	1		4
54	5				0
55	4	2			1
56	4	2			1
57	4	1			1
58	5				0
59	2	3			3
60	1	2	2		6
61	3	2			2
62	2	1	2		5
63	5				0
64		2	2	1	9
65	2	2	1		4

It is apparent from this table that the control group made little improvement in the formation of the "t's" and "d's" when compared with the experimental group, but this was to be expected as this group received no specific directions as to the expected way they were to form these precise letters as had the experimental group.

A further analysis of the range between both groups is shown by table 3 using a t test of difference between means.

TABLE 3

A COMPARISON BETWEEN THE MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS

N = 92 N (X) = 28 N (C) = 64

X = Experimental C = Control

	Mean			t Value
	X	C	Difference	
Physical Writing Change	9.50	2.75	6.75	10.65 *
Self- concept Change	4.68	-1.47	6.15	4.64 *

* Significant beyond the .01 level of confidence.

These mean scores verify the range between the two groups, both experimental and control. The t scores reflect the statistical gain beyond the .01 level of confidence.

This table and Table 4 depict the means and ranges useful in estimating the gains or losses registered by the groups in the study.

The table on the following page shows the range between the mean and standard deviation of both groups.

TABLE 4

A COMPARISON OF THE RANGE BETWEEN THE MEAN AND THE STANDARD DEVIATION OF THE EXPERIMENTAL AND THE CONTROL GROUP

N = 92 N (X) = 28 N (C) = 64

X = Experimental C = Control

	Mean		Standard Deviation		r	
	X	C	X	C	X	C
Writing Change	9.5	2.8	3.1	2.1	.57	.21
Self-concept Change	4.7	-1.5	5.8	5.9		

The range between the experimental and control group is clearly seen by the above data based on the standard deviation between the two groups.

In order to get a more detailed study of these tables it was necessary to investigate first the changes in the physical handwriting of the two groups as shown in Table 5.

TABLE 5

CHANGE IN PHYSICAL HANDWRITING OF EXPERIMENTAL AND CONTROL GROUP PUPILS

Amount of Improvement in Handwriting	Number of Pupils by Group	
	Experimental	Control
0- Little or none	2	44
1- Slight	5	19
2- Moderate	11	1
3- Great	10	0

The preponderance of desired handwriting change in d's and t's did occur in the experimental group as Table 5 illustrates. Gain was especially noted in the moderate and great amount areas, while only two pupils showed little or no gain. The greatest changes occurred in the experimental group where three out of four individuals showed marked improvement in their handwriting.

On the other hand, the control group found almost two out of three pupils registering little or no gain, and the remainder showed only slight gain with the exception of one case where moderate progress was noted. From this data, it was apparent that the pupils in the experimental group had achieved physical handwriting improvements much above that achieved by the control group. This fact, however, was to be expected by the very nature of this part of the experiment.

Table 6 further substantiates these findings and shows the results of a Chi square analysis with collapsed categories.

TABLE 6

CHI SQUARE TEST OF INDEPENDENCE BETWEEN CHANGE IN HANDWRITING AND GROUP

Group	Change in Handwriting	
	Little or Slight	Moderate or Great
Experimental	7	21
Control	63	1

$X^2 = 52.93$ (Significant beyond the .05 level)

Inspection of Table 6 shows that 75 percent of the experimental group pupils and only 1.6 percent of the control group pupils showed moderate or great gains in handwriting. Table 6 also indicates that this difference is statistically significant at the .05 level. These findings indicate that the results achieved by the experiment are not likely due to chance.

Comparison of Results of Raw Test Data

Table 7 represents the raw data for both the experimental and the control group arranged in numerical order and shows both the physical writing changes and the self-concept changes with loss and gain according to the test norms.

TABLE 7

RAW DATA OF THE SUBJECTS IN

THE EXPERIMENTAL GROUP

Experimental Group				
Student	Physical Writing	Self-concept Test Results		
Number	Change	Pre-test	Post-test	Loss-Gain
1	13	46	50	4
2	12	70	72	2
3	9	72	68	-4
4	12	70	76	6
5	12	48	56	8
6	14	63	70	7
7	2	70	65	-5
8	2	48	45	-3
9	6	64	76	12
10	10	78	85	7
11	8	58	63	5
12	9	62	65	3
13	10	74	88	14
14	14	57	66	9
15	Ill-----out of the entire project----------			
16	8	54	49	-5
17	Moved---out of the entire project----------			
18	13	60	76	16
19	7	71	68	-3
20	9	56	56	0
21	11	65	73	8
22	12	62	69	7
23	9	74	74	0
24	12	57	72	15
25	7	84	86	2
26	10	70	79	9
27	12	58	62	4
28	7	74	74	0
29	9	77	87	10
30	7	79	82	3
Total Gain	266	1821	1952	131
Average Mean Score Gain				
--	9.50	--	6.97	4.68

In reading this table, it is appropriate to mention that a score of 15 in the physical writing change column represents a perfect score, and zero represents absolutely no improvement at all according to the certified graphoanalysts who examined the writing. Furthermore, a perfect score in the self-concept column according to the norms of the test, would be 100.

The average mean score data show a gain of 4.68 in the experimental groups self-concept.

Table 8 contains the data for the control group.

TABLE 8

RAW DATA OF THE SUBJECTS

IN THE CONTROL GROUP

Control Group				
Student	Physical Writing	Self-concept Test Results		
Number	Change	Pre-test	Post-test	Loss-Gain
1	7	77	79	2
2	5	76	77	1
3	0	69	63	-6
4	3	82	86	4
5	4	49	52	3
6	2	72	64	-8
7	4	85	75	-10
8	1	67	70	3
9	2	88	80	-8
10	1	75	72	-3
11	5	64	60	-4
12	6	70	74	4
13	4	41	56	15
14	0	50	43	-7
15	3	75	79	4
16	1	78	76	-2
17	0	60	46	-14
18	6	60	53	-7
19	1	89	84	-5
20	1	81	77	-4
21	3	72	72	0
22	3	75	73	-2
23	1	69	76	7
24	1	65	67	2
25	2	74	66	-8
26	3	44	45	1
27	1	66	63	-3
28	1	73	73	0
29	Moved---out of the entire project----------			
30	1	67	73	6
31	2	72	81	9
32	3	67	62	-5
33	2	56	59	3
34	2	50	55	5
35	5	74	69	-5
36	1	37	33	-4
37	2	66	65	-1
38	4	88	90	2
39	2	50	44	-6
40	1	62	64	2

TABLE 8 - Continued

Student Number	Physical Writing Change	Self-concept Test Results Pre-test	Post-test	Loss-Gain
41	2	71	74	3
42	2	60	53	-7
43	3	74	74	0
44	2	57	56	-1
45	0	74	76	2
46	6	77	70	-7
47	7	83	76	-7
48	3	69	58	-11
49	7	83	81	-2
50	6	67	69	2
51	4	72	67	-5
52	2	63	50	-13
53	4	72	68	-4
54	0	68	67	-1
55	1	35	37	2
56	1	79	75	-4
57	1	54	54	0
58	0	87	77	-10
59	3	82	79	-3
60	6	55	67	12
61	2	80	68	-12
62	5	71	79	8
63	0	42	41	-1
64	9	61	69	8
65	4	60	59	-4
Total Gain	99	4334	4240	-94
	Average Mean Score Gains			
--	1.55	--	66.25	-1.47

The average mean score data show a loss of -1.47 in the control groups self-concept. This result was totally unexpected and it is difficult to identify the exact reason for this sharp drop. Possible probabilities for this change will be discussed in depth in the last chapter.

The relationship between physical handwriting stroke change and self-concept evaluation is shown by the data in Tables 9 and 10. Some individual self-concept im-

provement did occur independently within the control group for reasons other than the writing experiment. These changes probably were due to natural causes mentioned earlier in this study. In some of these cases there was a corresponding improvement in handwriting as well, while in other cases there was little or no relationship between the writing and loss or gain in self-concept. The variance was so great that it was difficult to try and acquire a meaning correlation in this area of the research.

Analysis of Test Result Data

The hypothesis was tested by a multiple regression analysis with the level of significance for acceptance or rejection set at the .05 level. The results of this analysis are shown in Table 9.

TABLE 9

A REGRESSION ANALYSIS OF POST SELF-CONCEPT SCORES ADJUSTED FOR INITIAL SELF-CONCEPT SCORES AND GROUP

N = 92 N (X) = 28 N (C) = 64

		Adjusted means		
Criterion Measure	R^2	Program	Control	F Ratio
Self-concept	.7768	71.54	65.52	19.33*

Adjusting Variables: Group, pre-self-concept scores.
*Significant beyong the .05 level.

A comparison and analysis of the data shows that significant gain beyond the .05 level was achieved. The experimental group showed a higher self-concept as compared to an unexpected drop in self-concept in the control group. When these statistical results are equated with the influence of the prior mentioned variables of both experimental and control groups the evidence would seem to indicate that there is a strong possibility that some sort of change in personality can be induced by a change in an individual's handwriting. Further statistics to reinforce this supposition can be found in the following table. This particular table shows and emphasizes the drop in R^2, the contribution handwriting makes to the prediction of self-concept.

TABLE 10

CONTRIBUTION OF CHANGED HANDWRITING
TO PREDICTION OF SELF-CONCEPT

R^2 Full Model	R^2 Restricted Model	R^2 Drop
.7768	.7283	.0485

R^2 Full Model Prediction: Group and pre-self-concept score
R^2 Restricted Model Prediction: Pre-self-concept score.

Table 10 shows a drop in R^2 of nearly 5 percent. This indicates that the handwriting treatment accounted for nearly 5 percent of the variance in self-concept scores.

The significance of the difference in the performance of the two groups show that the changes from the initial pre-test of self-concept to the post-test 30 days later reflect rather consistent gains by the individuals participating in the experimental group.

Reference should be made to the fact that, while there was a relationship between improved handwriting and improved self-concept in the experimental group, where change was to be expected if it were to occur at all, there was also a corresponding relationship between improved handwriting and self-concept occurring in a small number of pupils in the control group. There also were some isolated relationships as well as reversals in both groups. These

unaccountable changes were due to other factors other than the experiments in the changing of handwriting strokes.

Influences that could bring about improvement in an individual's self-concept might be: improved home conditions, improved health, new friends, a new teacher, a normal increased spurt in learning, or other similar factors.

SUMMARY

To summarize the above data, the analysis and comparison of the research shows that improved gains beyond the .05 level of significance was achieved with an F ratio of 19.33. A comparison between the means, using a t score, showed a significant gain beyond the .01 level of confidence. The relationship of mean scores of the experimental group was 9.50 for the physical handwriting change to 1.55 for the control group, and 4.68 for the experimental group in improved self-concept, while the control group showed a minus 1.47 for a decrease in self-concept. The most revealing statistic was the drop in R^2 of nearly 5 percent, for this indicates clearly that the handwriting treatment accounted for nearly 5 percent of the variance in self-concept scores of both experimental and control groups.

CHAPTER V

IMPLICATIONS, EXTENSIONS, SUMMARY AND CONCLUSIONS

In the best tradition of research, this study, while answering one question, raised several others. What happened to the self-concept of the majority of the students in the control group? Why should a group of over 60 children find that in 30 short days their self-concept dropped to an average of minus 1.47?

One possibility might be that the test used was highly susceptible to short range fluctuation and therefore not an accurate picture of the child's self-concept. Further research should probably be done on this test to check its validity over long periods of time. Personality assessment tests are difficult to validate, due to the great number of variables involved, and subsequently they are not too numerous. Despite these variances, this test was the most appropriate for this research.

A second possibility might be the attitude of the teachers involved. The control teachers were of the "child centered" and progressive school of training and allowed more freedom of child choice. The experimental teacher, while "child centered" also, was more exacting

and expected much from her children in all areas of academic growth. This theory of children achieving success in proportion to what is expected of them is thoroughly covered in Pygmalion in the Classroom as well as in other books. (Rosenthal, 1968)

Another factor was that these children were now in the intermediate grades and had left the more secure and relaxed atmosphere of the primary grades. This grade change is difficult and the adjustment is not always easy for all children. Other factors to consider are that the enthusiasm of the initial days may have diminished; the new teachers, materials, standards and rules may have become routine by this time.

Finally, there is no doubt that the personality of the teachers involved played a great role in the final results. Nevertheless, the experimental group faced these same problems and possibilities, and they still showed a marked improvement in self-concept.

What caused one group to show such improvement in the area of concern and the other a marked decrease? The experiment with handwriting is one highly logical explanation. The Hawthorne effect cannot be discounted, however, even though a great attempt was made to diminish its effect as much as possible. To isolate the Hawthorne effect completely is difficult if not impossible due to its very nature.

> For all the popularity of the concept, Hawthorne effects are only poorly understood. It is not only that we do not know how these effects operate, but also that we do not know quite what we mean when we use the term.
>
> ...Expectancy plays a large role in this concept for when programs of change are instituted, expectations for their effectiveness are likely to be involved. First are those whose behavior is being affected by the program and secondly there is the expectation of those who institute the change. (Rosenthal, Jacobson, 1968, p. 166)

With these facts in mind, it is always possible that had the innovation not been introduced, the results of the scorer might still have been the same. Even though the pupils had been exposed to many previous experiments and the examiner made only one appearance during the research to both experimental and control groups, when the project was introduced, the "Hawthorne effect" cannot be discounted.

One of the original opening remarks of this paper called attention to the great difficulty the schools, and indeed society itself, was having in dealing with the new non-conformists, those individuals who feel no urge or necessity to put any sort of restrictions on their personal needs or desires in an attempt to satisfy their own individual demands. It is my opinion that the history of progress in any society has been that of personal self-sacrifice of the individual for the good of the community.

It would seem that the best approach to the solution of such a momentous problem would have to be a subtle one. It could be implemented in a refined, dignified

manner so the recipient is not likely to reject those instilled traits that reflect understanding, consideration, and concern for others.

Could cooperation, consideration, and compassion be instilled in the penmanship lessons of each school in the country? The answer might be as simple as a few minutes of handwriting drills a day. This research indicated this possibility and is probably worthy of consideration.

Extentions

If the implications of this paper could be researched further to validate or repute its tentitive findings, and if reliability could be established, then its application could be applied in many areas. The application of this theory in the following pages is contingent upon further investigation to prove its existance.

Juvenile courts and teenage problems might be especially receptive to such therapy. At this age youngsters are in the process of developing those traits that will influence their behavior for years to come. Punishments, directives by parents, coddling and sternness, have all proved wanting in dealing with serious teen problems. It might be possible to adjust and correct a juvenile with emotional problems by painless handwriting techniques, unsupervised by close adult inspection, a process in which the juvenile could direct his own correction.

Graphotherapy might have manifold uses in the field of industry. For example, it would appear possible to instill in an individual closer attention to detail and to improve the ability to concentrate, which could be of great importance to the bookkeeping departments. In the area of sales work, more initiative and persistance could possibly be instilled and negative traits might be minimized. Personnel work could be enhanced by possible corrections made in individuals to meet the various demands of the job. The potential of graphotherapy if valid and substantiated, in this area is limitless. The possibility of utilizing graphotherapy to enhance productivity in industry is an interesting speculation.

Graphotherapy could be used effectively in marriage counseling. As time passes and people grow, they often acquire new and different traits which often lead to new conflicts in a slow and unnoticed fashion, so that people are not even aware that change has taken place until it is too late. If these conflicts cannot be handled or changed in a usual way, adjustment might be made by changes in one or both spouses' handwritings.

In summary there is no field of endeavor which might not benefit from the use of graphotherapy in some way. Graphotherapy's application in attempting to improve human relations could be useful in multiple areas.

This research initially sought to answer a question; in the process of answering it, several more were raised, some of which are highly challenging. This paper

illuminates a small light leading to the vast and expansive room of personality traits in individuals. The work done on this dissertation expounds the possibility that man may possibly be able to better understand his behavior and perhaps influence it by investigating the function of his handwriting. It may be that as simple a tool as conformity in penmanship may be the key to conformity in man's behavior.

Further research in this is needed to validate these findings and to check for reliability of the groundwork layed by this paper.

The Problem

This study was conducted to establish positive, statistical evidence that if a group of fourth grade students attending the Hi-Mount Boulevard Elementary School were given specific instructions in handwriting emphasizing particular stroke changes, corresponding improvement in character traits might evolve that would influence growth in self-concept. The question was whether the experimental group would achieve significantly higher self-concept scores than the control group, who were instructed in the traditional handwriting program. The research was conducted in an urban middle class neighborhood in the city of Milwaukee, Wisconsin. Three groups of students from the fourth grade were involved in the study. The total

number of students starting the research was 95. However, two students moved and one became ill for an extended period, thus reducing the number to 92. Of this number, 28 were in the experimental group; 64, in the control group. Each of the above groups received a pre-test in self-concept and handwriting as well as a post-test in these areas 30 days later in order to observe any change that might have occurred. The object was to find whether change in personality and character traits could be induced by a change in certain handwriting strokes. A further prognosis suggests that this practice of changing character traits through changes in handwriting, known as graphotherapy, might become an influential and practical tool in bringing about changes in personality.

Summary of the Findings

At the completion of the 30 day experimental period, post-tests were administered and the final results indicated that the experimental group achieved an overall degree of success in excess of the .05 statistical level of significance and a gain beyond .01 in the mean scores confidence level. There was a corresponding improvement in handwriting as well, judged by five graphoanalysts who were unaware of the identity of either the control or experimental groups. An added dimension of the findings

was indicated by a small number of students in the control group who, independent of the experimental group, also registered some gain in self-concept. A check of this group's handwriting showed many also improved in the same identical stroke formations being taught the experimental group, although the control group was oblivious of the prescribed shape forms taught the experimental group. Others, however, showed improved self-concept with no noted improvement in their handwriting. Why this occurred might be the basis for another research project.

The area of concern of this research was in the possibility of change occurring in pupil self-concept resulting from handwriting stroke changes. Improvement was registered in self-concept scores using the F ratio. Statistical results tend to substantiate the basic premise: changes in character traits and personality, it appears, can be influenced and possibly controlled by the use of various prescribed handwriting strokes.

A study of the mean scores revealed a problem of concern. The experimental group showed an improved self-concept image increase of 4.68 during the six week experimental period; while the control group, during the same period, showed a sharp self-concept drop to a minus 1.47. It might be expected that if no gain was made, at least, no loss would be registered; yet a disturbing loss was noted.

General Conclusions

The majority of evidence, at least in this research, indicates that despite several important variables and some unexplained variations, there is reason to believe that handwriting did influence the traits of self-concept in the experimental group and warrants further study and investigation.

This study, an investigation to see if character change could be influenced by changing handwriting strokes, was not envisioned as investigating long-term retention of any traits changed, although this is possible. The fact that change had occurred and was verified to an extent by the testing procedures used was considered sufficient for this study. That such comparative results did occur was surprising and revealing. It would be left for future research to investigate other aspects of the matter, including the possible long term duration of self-concept traits instilled by this method.

The results of this study were actually twofold. They showed that there was a close relationship between character traits and the various handwriting strokes, and secondly, they showed that graphotherapy, the process of deliberately changing handwriting strokes to bring about change in character was feasible and quite possible workable.

These facts were fortified by the test results of

the experimental and control groups. Self-concept was measured by "The Self-Appraisal Inventory," distributed by Instructional Objectives Exchange, Los Angeles, California, and physical writing changes were verified and examined by five certified graphoanalysts.

The self-concept of the experimental group showed a post-test increased gain in mean score of 4.68 compared to a drop in self-concept of the control group to a minus 1.47 (See Table 7 and 8) and a gain of 19.33 using a F ratio and 4.64 using a t value, both significant statistically. (See Tables 9 and 3) The discrepancy between the scores is further compounded by the fact that both groups were chosen at random from the same neighborhood, which would indicate similar socio-economic backgrounds.

The discrepancy between the physical handwriting changes of the two testing groups is revealed by the 9.50 mean score gain in handwriting for the experimental group and a 1.55 handwriting gain registered by the control group. (See Tables 7 and 8) Attention should be directed to some reversals that did occur in the experimental group as well as incidence of some handwriting improvement that evolved in a small number in the control group.

The testing of the hypothesis by a multiple regression analysis with the level of significance set at the .05 level showed the statistical gains made as well as the comparison of the handwriting stroke changes to bring

about improvement in self-concept. (See Table 9)

With the accumulation of data from these varied sources in comparing the experimental and control groups, it is established that a correlation between changes in handwriting strokes and self-concept was established. The indisputable fact is that something did cause positive change in the experimental group and the research and documentation offer evidence that the handwriting stroke formations was a factor in explaining this change. Whether it was the dominent factor would have to await further research with better control over the variables.

Problems

Something new and not easily understood by the general public is always difficult for it to accept. It will be even more difficult for the public to accept the premise that handwriting influences character and that one's personality and character traits might be controlled under the proper guidance and direction of a skilled handwriting expert. This is so not only because of past experiences on the part of the public with charlatans, pseudo-experts, and practices of some unscrupulous persons, but also because of the stigma handwriting analysis has had to overcome due to misunderstandings in equating it with fortune telling, crystal balls, and the occult.

Old prejudices are long in dying and people fear

that which they do not understand. It is for these reasons that the acceptance of this research may be long in arriving. More research and statistical proof are needed to convince both skeptics and persons with unbiased opinions as to the merit or worth of the facts uncovered in this paper.

Recommendations for Further Study

This concept is so unusual and the area so unexplored that possibilities for new studies are literally limitless. This paper merely introduces the potentials that are within the realm of study in this area. The directions such research could take are without limit, so only a few probabilities will be mentioned here.

The most important extension of this paper would be to further investigate its validity. This could be done by expanding not only the number of people involved in the experiment, but by trying to impose greater controls over the number of variables in such research. So important is the potential of graphotherapy, that it is imperative further research be done to enforce its reliability.

Another extension of exploration would be the use of handwriting stroke changes in an attempt to influence or change any, or all, of those character traits deemed undesirable by society. If, as this paper intimates, a

trait such as self-concept may be imposed on an individual or a group of people, then any or all human traits may also be so imposed. Such traits as dishonesty, deceit, temper, or any other trait one chooses, might be removed from a personality just as a change in self-concept was introduced into the experimental group in this research.

Other research might investigate the changes brought about in schools with the abolishment of formal penmanship classes. Could it be possible that discipline in the classroom was actually being imposed during the formal penmanship classes? Did the old-fashioned writing drills teach and instill more than just legibility in handwriting? Did they actually teach conformity and cooperation as well as other similar character traits unknown to both educator and pupil?

Another project might explore the length of endurance of such graphotherapy imposed traits. Are traits imposed on an individual as enduring as those achieved in the usual manner? How much drill would be necessary to make graphotherapy traits as permanent as those acquired in the usual fashion, if they prove not as enduring?

Could graphotherapy be better applied to individual cases rather than to large groups? Would the benefits be greater and more lasting? Would a person respond more readily and successfully if he knew why he was practicing

certain handwriting strokes?

What character traits would be the easiest to instill? Which the most difficult? Can one impose traits that are repugnant to the personslity of an individual?

The ultimate question probably is: Can society mold every individual into the exact form and image society wants? Can it, in fact, create the "programmed man"? Would society want to do that?

The answers to these and many other questions await further research, but the possibilities and challenges are vast and possibly awesome.

APPENDIX A*

SELF APPRAISAL INVENTORY

Intermediate Level

Description and Rationale

This inventory consists of statements to which students respond "true" or "untrue" to indicate whether each statement is true or untrue about them. The statements may be read independently by the students or orally by the teacher, depending on the students' reading ability.

This self report device attempts to secure in a rather straightforward fashion, a child's responses to questions which pertain to four aspects of the self-concept. Three of these four dimensions (family, peer, scholastic) are viewed as arenas in which one's self-concept has been (or is being) formed. A fourth dimension reflects a more general, global estimate of self-esteem. Examples of each dimension (for which sub-scale scores are obtainable in the inventory are) (1) General: "I can always be trusted." (2) Family: "I often get in trouble at home." (3) Peer: "Most children have fewer friends than I do." (4) Scholastic: "Schoolwork is fairly easy for me." From these examples it can be

* Self Appraisal Inventory (Intermediate Level) by the Instructional Objectives Exchange, Box 20495, Los Angeles, California 90024, removed due to copyright restrictions.

seen that if a child wished to answer untruthfully, in such a way that he would be viewed in a better light, it would not be too difficult to do so. Such tendencies to supply false responses can be minimized by administering the inventory in such a way that the anonymity of the respondent is both real and perceived.

Directions for Administration

The Self Appraisal Inventory, Intermediate Level, may be administered in three ways, depending upon the objective(s) of interest:

1. The entire measure (that is, all statements) may be used, and a single score obtained, yielding a global estimate of self-concept.
2. The entire measure may be administered, but subscales (peer, family, school, general) relating to the various dimensions scored separately, yielding information regarding each dimension of self-concept.
3. Only those subscales representing the dimensions of interest may be administered and scored.

Items which represent each subscale within the Self Appraisal Inventory are as follows:

Peer: Items 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57, 61,65,69,73,77,81,85,89,93,97;

Family: Items 2,6,10,14,18,22,26,30,34,38,42,46,50,54, 58,62,66,70,74,78,82,86,90,94,98;

School: Items 3,7,11,15,19,23,27,31,35,39,43,47,51,55, 59,63,67,71,75,79,83,87,91,95,99;

General: Items 4,8,12,16,20,24,28,32,36,40,44,48,52,56, 60,64,72,76,80,84,88,92,96,100.

It is expected that students will be able to complete the entire inventory in approximately twenty to thirty minutes. If the administrator feels that the students' reading abilities will prohibit their completing the measure in this time period, the statements should be read orally to the students.

If the instruments are to be hand scored, the answer sheet provided may be used. If machine scoring is available and is to be used, responses should be recorded on the appropriate answer sheets; additional instruction in the use of these answer sheets may be necessary.

After distributing the booklets to the students, carefully read the directions provided with the inventory aloud. Provide ample time for students to ask questions concerning the response procedure.

Emphasize that there are no "right" or "wrong" answers. Re-

mind the students that they are not to write their names on the answer sheets. If additional information is needed from the students, for example, their class or school, be sure to have them add this information to the answer sheet.

If students ask questions regarding interpretations of the statements, emphasize that the inventory calls for general impressions regarding each statement.

Scoring

Scores may be obtained by counting one point for each positive response; that is, for each "true" or "untrue" response which indicates:

1. General favorable perceptions of self (general subscale)
2. Favorable view of self in relations with peers (peer subscale)
3. Favorable view of self in the family context (family subscale)
4. Favorable view of self in school situations, involving school work, teacher, etc. (school subscale)

The positive responses for each subscale are indicated on the attached scoring guide.

For hand scoring, a scoring template may be prepared by

punching out positive responses in the scoring guide (for all items) or for only those items in the subscale(s) of interest. The template may then be placed over the student's response sheet, and the number of responses appearing through the punched holes recorded.

Average scores for a group of students, for the entire inventory, or for a particular subscale, may be computed by summing the scores for all pupils and dividing by the number of pupils in the group.